

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously presented) A method for detecting target oligonucleotides in a sample comprising:

(a) providing a sensor device having a sensing interface carrying capturing oligonucleotides wherein each capturing oligonucleotide has a nucleotide sequence, a stably hybridizing portion of which is complementary to a first portion of the target oligonucleotides, wherein said sensor device comprises an electrochemical probe carrying the sensing interface and the probe is located in a surrounding medium;

(b) providing verification oligonucleotides wherein each verification oligonucleotide has a nucleotide sequence, a stably hybridizing portion of which is complementary to a second portion of the target oligonucleotides, other than said first portion;

(c) contacting the sample with the sensing interface under conditions such as to allow the target oligonucleotides, if present in the sample, to hybridize to the capturing oligonucleotides;

(d) prior to (c) or thereafter, allowing the verification oligonucleotides to hybridize to the target oligonucleotides if present in the sample; and

(e) detecting the presence of said verification oligonucleotides on the sensing interface by measuring insulation of the sensing interface to interfacial electron transfer between the sensing interface and the surrounding medium.

2. (Original) The method of Claim 1, wherein said detection is based on Faradaic impedance spectroscopy or amperometric measurement.

3. (Previously presented) The method of Claim 1, wherein the stably highly hybridizing portions of the capturing and verification oligonucleotides are of about 12 nucleotides.

4. (Previously presented) The method according of any one of Claims 1-3, wherein the verification oligonucleotides are conjugated to a recognition agent which can specifically bind to a signal-amplifying agent, and step (e) is performed by:

- (e1) contacting the sensing interface with said signal-amplifying agent;
- (e2) detecting the presence of said signal-amplifying agent on the sensing interface.

5. (Original) The method of Claim 4, wherein said recognition agent is biotin and said signal amplifying agent comprises avidin.

6. (Previously presented) The method of any one of Claim 1-3, wherein said verification oligonucleotides are bound to or complexed with a signal-amplifying agent, and step (e) is performed by detecting the presence of the signal-amplifying agent on the sensing interface.

7. (Previously presented) The method of any one of Claims 1-3, wherein the verification oligonucleotides comprise a first recognition agent which specifically binds to a recognition partner form a recognition couple, step (e) is performed by the following steps:

- (e1) contacting said sensing interface with said recognition partner;
- (e2) contacting said sensing interface with a signal-amplifying agent comprising a second recognition agent, which may be the same or different as the first recognition agent, which can also bind to said recognition partner; and
- (e3) detecting presence of said signal-amplifying agent on said sensing interface.

8. (Previously presented) The method of Claim 7, further comprising a step between steps (e2) and (e3):

- (e2.1) repeating steps (e1) and (e2) one or more times.

9-22. (Canceled)

23. (Previously presented) A method for detecting a target oligonucleotide in a sample, comprising:

(a) providing a sensor device having a sensing interface carrying capturing oligonucleotides wherein each capturing oligonucleotide comprises a nucleotide sequence, a stably hybridizing portion of which is complementary to a first portion of the target nucleotides;

(b) providing verification oligonucleotides wherein each verification oligonucleotide comprises a nucleotide sequence, a stably hybridizing portion of which is complementary to a second portion of the target oligonucleotides, other than said first portion, wherein the verification oligonucleotides is capable of binding to a signal-amplifying agent comprising a liposome,

(c) contacting the sample with the sensing interface under conditions so as to allow the target oligonucleotides, if present in the sample, to hybridize to the capturing oligonucleotides;

(d) prior to (c) or thereafter, allowing the verification oligonucleotides to hybridize to the target oligonucleotides if present in the sample;

(e) contacting the sensing interface with said signal-amplifying agent; and

(f) detecting the presence of said signal-amplifying agent on the sensing interface by monitoring electron transfer resistance of the sensing interface.

24. (Original) The method of Claim 23, wherein said sensor device comprises an electro chemical probe carrying the sensing interface.

25. (Original) The method of Claim 24, wherein said detection is based on Faradaic impedance spectroscopy or amperometric measurements.

26. (Currently amended) The method of Claim 23, wherein said sensor device comprises a quartz-crystal microbalance probe carrying the sensing interface.

27. (Original) The method of Claim 26, wherein said detection is based on a microgravimetric quartz-crystal microbalance (QCM) analysis.

28. (Previously presented) The method of any one of claims 23-27, wherein the stably hybridizing portion of the capturing oligonucleotide is of about 12 nucleotides and the stably hybridizing portion of the verification oligonucleotide is of about 12 nucleotides.

29. (Previously presented) The method according to any one of Claims 23-27, wherein the verification oligonucleotide is conjugated to a recognition agent which can specifically bind to said signal-amplifying agent.

30. (Original) The method of Claim 29, wherein said recognition agent is biotin and said signal amplifying agent comprises avidin.

31. (Previously Presented) The method of any one of Claims 23-27, wherein said verification oligonucleotide is bound to or complexed with said signal-amplifying agent.

32. (Previously Presented ) The method of any one of Claims 23-27, wherein the verification oligonucleotides comprises a first recognition agent which specifically binds to a recognition partner to form a recognition couple, step (e) of the method comprising the following steps:

(e1) contacting said sensing interface with said recognition partner;

(e2) contacting said sensing interface with said signal-amplifying agent comprising a second recognition agent, which may be the same or different as the first recognition agent, which can also bind to said recognition partner.

33. (Original) The method of Claim 32, comprising the following step after step (e2):  
(e2.1) repeating steps (e1) and (e2) one or more times.

34-47. (Canceled)

48. (New) The method of claim 1, wherein the presence of the verification oligonucleotide on the sensing interface causes an increase in the insulation of the sensing interface to interfacial electron transfer between the sensing interface and the surrounding medium.